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LightRanger 11 Click





PID: MIKROE-5864

LightRanger 11 Click is a compact add-on board suitable for range-finding and distance-sensing applications. This board features the VL53L7CX, a time-of-flight 8x8 multizone ranging sensor from STMicroelectronics. It is a fast and accurate multizone distance-ranging sensor width of 90° wide FoV. The multizone-ranging output with either 4x4 or 8x8 separate zones, width multitarget detection, and distance measurement in each zone. As a multizone-ranging device, its range is only up to 350cm. This Click board™ makes the perfect solution for the development of presence (object) detection applications, distance measurement, industrial ranging, inventory control, and many other applications.

LightRanger 11 Click is supported by a mikroSDK compliant library, which includes functions that simplify software development. This Click board™ comes as a fully tested product, ready to be used on a system equipped with the mikroBUS™ socket.

How does it work?

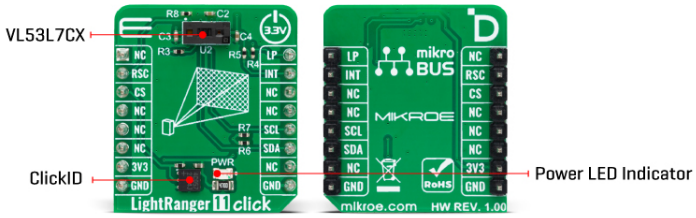
LightRanger11 Click is based on the VL53L7CX, a time-of-flight 8x8 multizone ranging sensor from STMicroelectronics. This ToF sensor integrates a VCSEL (vertical-cavity surface-emitting laser), which emits an entirely invisible 940nm IR light, totally safe for eyes (Class 1 certification), and a SPAD (single-photon avalanche diode) array which helps the VL53L7CX to achieve the best-ranging performance even when a Click board™ is hidden behind a wide range of cover glass materials. In addition, the sensor is equipped with diffractive optical elements (DOE) on both the transmitter and the receiver, enabling square FoV.

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Designed explicitly for small-range and multi-target measurements, the VL53L7CX provides very accurate distance measurements up to 350cm with excellent results over short distances and 60° x 60° square field of view (FoV) (90° diagonal), which improves performances under ambient light. Thanks to ST's patented algorithms, the VL53L7CX can detect multiple objects within the FoV with depth understanding. ST histogram algorithms ensure cover glass crosstalk immunity beyond 60cm. Like all Time-of-Flight sensors based on ST's FlightSense technology, the VL53L7CX records an absolute distance measurement regardless of the target color and reflectance.

LightRanger 11 Click uses a standard 2-Wire I2C interface to communicate with the host MCU, read data, and configure settings with a maximum clock frequency of up to 1MHz. The I2C interface on Click board™ can be reset through the RSC pin of the mikroBUS™ socket, hence offering a switch operation to turn ON the initial I2C starting sequence of the VL53L7CX. It also possesses an additional interrupt pin, routed to the INT pin on the mikroBUS™ socket, indicating when a ranging measurement is available. An LP pin lets you turn the I2C communication on or off when in low power mode, which is used when it is required to change the I2C address in multi-device systems.

This Click board™ can be operated only with a 3.3V logic voltage level. The board must perform appropriate logic voltage level conversion before using MCUs with different logic levels. Also, this Click board™ comes equipped with a library containing easy-to-use functions and an example code that can be used as a reference for further development.

Specifications

Type	Optical
Applications	Can be used for the development of presence (object) detection applications, distance measurement, industrial ranging, inventory control, and many other applications
On-board modules	VL53L7CX - time-of-flight 8x8 multizone ranging sensor from STMicroelectronics
Key Features	Multizone ranging output with either 4x4 or 8x8 separate zones, multitarget detection and distance measurement in each zone, histogram processing and algorithmic

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	compensation, motion indicator for each zone, and more
Interface	I2C
ClickID	Yes
Compatibility	mikroBUS™
Click board size	S (28.6 x 25.4 mm)
Input Voltage	3.3V

Pinout diagram

This table shows how the pinout on LightRanger 11 Click corresponds to the pinout on the mikroBUS™ socket (the latter shown in the two middle columns).

Notes	Pin	mikroBUS				Pin	Notes
	NC	1	AN	PWM	16	**LP**	Low Power I2C Enable
I2C Interface Reset	**RSC**	2	RST	INT	15	**INT**	Interrupt
ID COMM	**CS**	3	CS	RX	14	NC	
	NC	4	SCK	TX	13	NC	
	NC	5	MISO	SCL	12	**SCL**	I2C Clock
	NC	6	MOSI	SDA	11	**SDA**	I2C Data
Power Supply	**3.3V**	7	3.3V	5V	10	NC	
Ground	**GND**	8	GND	GND	9	**GND**	Ground

Onboard settings and indicators

Label	Name	Default	Description
LD1	PWR	-	Power LED Indicator

LightRanger 11 Click electrical specifications

Description	Min	Typ	Max	Unit
Supply Voltage	-	3.3	-	V
Distance Measurement Range	0	-	350	cm
Field of View	-	90	-	deg
VCSEL Wavelength	-	940	-	nm

Software Support

We provide a library for the LightRanger 11 Click as well as a demo application (example), developed using MIKROE compilers. The demo can run on all the main MIKROE development boards.

Package can be downloaded/installed directly from NECTO Studio Package Manager (recommended), downloaded from our LibStock™ or found on Mikroe github account.

Library Description

This library contains API for LightRanger 11 Click driver.

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Key functions

- lightranger11_get_ranging_data LightRanger 11 get ranging data function.
- lightranger11_get_resolution LightRanger 11 get resolution function.
- lightranger11_get_int_pin LightRanger 11 get int pin function.

Example Description

This example demonstrates the use of LightRanger 11 Click board™ by reading and displaying 8x8 zones measurements on the USB UART.

The full application code, and ready to use projects can be installed directly from NECTO Studio Package Manager (recommended), downloaded from our LibStock™ or found on Mikroe github account.

Other Mikroe Libraries used in the example:

- MikroSDK.Board
- MikroSDK.Log
- Click.LightRanger11

Additional notes and informations

Depending on the development board you are using, you may need USB UART click, USB UART 2 Click or RS232 Click to connect to your PC, for development systems with no UART to USB interface available on the board. UART terminal is available in all MIKROE compilers.

mikroSDK

This Click board™ is supported with mikroSDK - MIKROE Software Development Kit. To ensure proper operation of mikroSDK compliant Click board™ demo applications, mikroSDK should be downloaded from the LibStock and installed for the compiler you are using.

For more information about mikroSDK, visit the official page.

Resources

mikroBUS™

mikroSDK

Click board™ Catalog

Click boards™

ClickID

Downloads

LightRanger 11 click example on Libstock

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VL53L7CX datasheet

LightRanger 11 click schematic

LightRanger 11 click 2D and 3D files

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